

# EXPERIMENTAL AND NUMERICAL INTEGRITY ASSESSMENT OF HOME WINDOW PROFILES AND FRAMES

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## Abstract

*Modern home windows include new approaches in their design and new material utilization to achieve best resistance to harsh weather conditions and to achieve best possible thermal insulation. Chosen internal structure of window frame and selected material affect on structural life. Integrity assessment of home window frames covers experimental and numerical approaches, including experimental DIC method (Digital Image Correlation-DIC) and FEA (Finite Element Analysis) numerical method. The aim of this research is to find the matching between both techniques and to use only numerical method in future to assess the structural life of home window frames with different internal structures in the design and different materials. Experimental testing is performed on the Universal tensile testing machine "Shimadzu AGS-X" with 100kN load capacity, which is sufficient for home window frame testing. DIC cameras are used for recording of the experimental technique and the output are displacements and deformations on observed structure. FEA simulation accepts the before experimental conditions, i.e. maximal load, material characteristics and geometry. Matching of experimental results and attained FEA simulation will allow for easier Integrity assessment using only numerical simulations for future tests. Therefore, with mentioned technique new internal structures of windows and different materials can be simulated and the obtained results will show if the chosen home window frame structure and material selection is sufficient enough for practical use.*

## Keywords

Home Window, Window Frames, Integrity Assessment, Experimental Methods, Numerical Analysis

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